

Instructor:	Parker Evans	Time:	M W F 8:30-9:25 am
Office:	(Basement) 50 Herman Brown Hall	Classroom:	Online
Email:	pge1@rice.edu	Office Hours:	M,W 6-7 pm
Class Webpage:	Look for MATH 211 003 Spring 2021 on Canvas		

Textbook: Farlow, Hall, McDill, West (2007). *Differential Equations & Linear Algebra*. Pearson.

Daily Assignments: Daily Videos and Assignments will be posted on Canvas. These assignments will not be collected. You are encouraged to discuss these problems amongst each other via Discussion board on Canvas.

Homework: There are **two** components of the homework: WebWork and Written HWs.

1. WebWork Homework will be due **every MWF**. It will be assigned through the WebWork website. Each student needs to sign up for a WebWork account and get familiar with WebWork as soon as possible. Most homework problems are to be completed online, and are quite similar to textbook exercises.

Instructions for the account setup will be announced soon!

It is **strongly recommended** that you keep a notebook where you write down complete solutions to the assigned exercises; you can use this notebook to study for exams. Imagine that a fellow student will be reading your homework notebook to study for an exam. If your work is not detailed enough to be useful, it is unlikely to earn much credit if it were being graded. Another student reading your solutions should be able to guess at the question you are trying to answer without referring to the textbook.

2. Written HWs problems should be submitted(uploaded) to Gradescope. Every Friday will be due dates of the written HW sets. These problems will be of a nature that cannot be covered by online systems. They will be graded and returned to you in a week after you hand them in.

Exams There will be two midterm tests during the semester and a comprehensive final exam. Midterm Exams will be on **Thursday March 4th** and on **Tuesday April 6th**. There will be two slots to take your exams either 6am or 7:30 pm (central time) on these assigned days. Midterm Exams are 2.5 total hours in length, *including time to upload solutions*.

Final exam: Final Exam will be determined by Registrar office.

Exams will be open to notes and textbooks. Make-up exams will be allowed only in the case of a documented medical emergency. If an exam conflicts with a holiday you observe, please let me know before the end of the first week of classes.

Grades: Your HWs will count as 30% (15%(Webwork)+ 15%(Written)) of your final grade and 20% Midterm I, 20% Midterm II, 30% Final.

The aim in Math 211 is that letter grades should not depend on whether a student's section is an "easy" or "hard" section. To that end, when computing final course grades, a student's exam scores are normalized against exam scores of all students in Math 211 this semester (not just those in this section), while a student's non-exam scores are normalized against the non-exam scores of students in this section. In particular, students should not assume that having higher raw scores on homework than on exams will necessarily increase their final letter grade.

Attendance: Attendance is not mandatory, but strongly encouraged. Missing class will hinder your performance in the course.

Inclusion: The Dept of Mathematics supports an inclusive learning environment where diversity and individual differences are understood, respected, and recognized as a source of strength. Racism, discrimination, harassment, and bullying will not be tolerated. We expect all participants in mathematics courses (students and faculty alike) to treat each other with courtesy and respect, and to adhere to the mathematics department standards of collegiality, respect, and sensitivity ([link to department statement on collegiality, respect, and sensitivity goes here](#)) as well as the Rice Student Code of Conduct. If you think you have experienced or witnessed unprofessional or antagonistic behavior, then the matter should be brought to the attention of the instructor and/or department chair. The Ombudsperson is also available as an intermediate, informal option, and contacting them will not necessarily trigger a formal inquiry.

Title IX: Rice University cares about your wellbeing and safety. Rice encourages any student who has experienced an incident of harassment, pregnancy discrimination or gender discrimination or relationship, sexual, or other forms interpersonal violence to seek support through The SAFE Office. Students should be aware when seeking support on campus that most employees, including myself, as the instructor/TA, are required by Title IX to disclose all incidents of non-consensual interpersonal behaviors to Title IX professionals on campus who can act to support that student and meet their needs. For more information, please visit safe.rice.edu or email titleixsupport@rice.edu.

Disability Support: Any student with a documented disability seeking academic adjustments or accommodations is requested to speak with me during the first two weeks of class. All such discussions will remain as confidential as possible. Students with disabilities will need to also contact Disability Support Services in the Allen Center.

Course Goals: Comfort with basic techniques (e.g. separation of variables) to solve differential equations, understanding the importance of linearity, comfort with handling homogeneous and non-homogeneous parts of an ODE, understanding of both the conceptual and computational fundamentals of linear algebra (e.g. vector space bases and computing determinants), comfort solving linear systems of differential equations, comfort with qualitative analysis of differential equations, especially equilibria.

Topics:

We will cover the following content from the textbook:

Table of Contents:

Section 1.1: Dynamical Systems: Modeling
Section 1.2: Solutions and Direction Fields: Qualitative Analysis
Section 1.3: Separation of Variables: Quantitative Analysis
Section 1.5: Picard's Theorem: Theoretical Analysis
Section 2.1: Linear Equations: The Nature of Their Solutions
Section 2.2: Solving the First-Order Linear Differential Equation
Section 2.4: Linear Models: Mixing
Section 3.1: Matrices: Sums and Products
Section 3.2: Systems of Differential Equations
Section 3.3: The Inverse of a Matrix
Section 3.4: Determinants and Cramer's Rule
Section 3.5: Vector Spaces and Subspaces
Section 3.6: Basis and Dimension
Section 4.2: Real Characteristic Roots
Section 4.3: Complex Characteristic Roots
Section 4.4: Undetermined Coefficients
Section 4.5: Variation of Parameters
Section 6.1: Theory of Linear DE Systems
Section 5.3: EigenValues and Eigenvectors
Section 6.2: Linear Systems with Real Eigenvalues
Section 6.3: Linear Systems with Nonreal Eigenvalues
Section 6.4: Stability and Linear Classification
Section 7.1: Nonlinear Systems
Section 2.6: Systems of Differential Equations: A First Look
Section 7.2: Linearization